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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/418,537	10/14/1999	MICHEL BERA	KXENP001	9018

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EXAMINER
HIRL, JOSEPH P

ART UNIT	PAPER NUMBER
2122	

DATE MAILED: 01/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

	Application No.	Applicant(s)
Office Action Summary	09/418,537	BERA ET AL.
	Examiner	Art Unit
	Joseph P. Hirl	2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____ .

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-24* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-24* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____ .

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .	6) ☐ Other: .

DETAILED ACTION

1.   Claims 1 - 24 are pending in this application.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 – 3, 5, 7, 11, 12, 14 – 17 and 22 - 24 are rejected under 35

U.S.C. 112, second paragraph, as being indefinite for failing to particularly point

out and distinctly claim the subject matter which applicant regards as the

invention.

Claim 1

Recites the limitation "the value".

Claim 2

Recites the limitations "the difference" and "the training data set".

Claim 3

Recites the limitation "the minimization".

Claim 5

Recites the limitations "the complexity", "the squares" and "the weights".

Claim 7

Recites the limitation "the input data".

Claim 11

Recites the limitation "the cross validation".

Claim 12

Recites the limitations "the cross validation" and "the Brent method".

Claim 14

Recites the limitation "the output".

Claim 15

Recites the limitations "the sum", "the squares", "the differences" and "the input".

Claim 16

Recites the limitations "the sum", "the differences", and "the input".

Claim 17

Recites the limitations "the maximum difference" and "the input".

Claim 22

Recites the limitation "the model".

Claim 23

Recites the limitations "the determined", "the training data set", "the aggregate training data set", "the output" and "the robust model".

Claim 24

Recites the limitations "the plurality" and "the value".

There is insufficient antecedent basis for these limitations in these claims.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Claims 1 – 11, 13 - 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Ratsaby et al (ACM 1996 0-89791-811-8/96/06, Referred to as **Ratsaby**).

Claim 1

Ratsaby anticipates selecting a modeling function having a set of weights wherein the modeling function has a complexity that is determined by a complexity parameter (**Ratsaby**, page 57, col 1, lines 14 – 27; page 59, col 1, lines 54 – 56; page 59, col 2, lines 1 - 3); for each of a plurality of values of the complexity parameter, determining an associated set of weights of the modeling function such that a training error is minimized for a training data set (**Ratsaby**, page 59, col 1, lines 10 - 19; page 59, col 1, lines 54 – 56; page 59, col 2, lines 1 - 3); determining an error for a cross validation data set for each set of weights associated with one of the plurality of values of the complexity parameter (**Ratsaby**, page 60, col 1, lines 19 - 25; page 59, col 1, lines 10 - 19; page 59, col 1, lines 54 – 56; page 59, col 2, lines 1 - 3); and selecting the set of weights associated with the value of the complexity parameter that best satisfies a cross validation criteria (**Ratsaby**, page 60, col 1, lines 19 - 25; page 59, col 1, lines 10 - 19; page 59, col 1, lines 54 – 56; page 59, col 2, lines 1 - 3); whereby the selected set of weights used with the modeling function provides the robust model (**Ratsaby**, page 61, col 1, lines 1 - 11) .

Claim 2

Ratsaby anticipates the training error is calculated using a training error criteria that is a function-of the difference between training output values

associated with training input values determined from the training data set and

output values determined from the modeling function and the associated set of

weights applied to the training input values (**Ratsaby**, page 57, col 2, lines 24 –

42; page 59, col 1, lines 10 - 19).

Claim 3

Ratsaby anticipates that the complexity parameter affects the

minimization of the training error (**Ratsaby**, page 59, col 1, lines 59 –

56; page 59, col 2, lines 1 – 3; page 64, col 2, lines 9 - 19).

Claim 4

Ratsaby anticipates the complexity parameter causes the training

error to be decreased for sets of weights that are more complex (**Ratsaby**, page

59, col 1, lines 59 – 56; page 59, col 2, lines 1 – 3; page 64, col 2, lines 9 - 19).

Claim 5

Ratsaby anticipates the complexity of a set of weights is determined

by the squares of the weights (**Ratsaby**, page 64, col 2, line 12).

Claim 6

Ratsaby anticipates the complexity parameter is a regularization factor.

(**Ratsaby**, page 59, col 1, lines 59 – 56; page 59, col 2, lines 1 – 3; page 58, col

2, lines 50 – 54).

Claim 7

Ratsaby anticipates the complexity parameter controls an amount of

noise that is added to the input data of the training set (**Ratsaby**, page 58, col 2,

lines 12 – 20).

Claim 8

Ratsaby anticipates the modeling function is a first order polynomial

(**Ratsaby**, page 58, col 1, lines 16 19).

Claim 9

Ratsaby anticipates the modeling function is a second order polynomial

(**Ratsaby**, page 58, col 1, lines 16 19).

Claim 10

Ratsaby anticipates the modeling function is a second order polynomial

that includes cross products between input values (**Ratsaby**, page 58, col 1,

lines 16 19).

Claim 11

Ratsaby anticipates the plurality of values of the complexity parameter are

selected to best satisfy the cross validation criteria using a Newtonian

minimization scheme (**Ratsaby**, page 60, col 1, lines 19 -25; page 59, col 1,

lines 54 - 56; page 59, col 2, lines 1 - 3).

Claim 13

Ratsaby anticipates including separating an empirical data set into a

training data set and a cross validation data set (**Ratsaby**, page 60, col 1, lines

19 –25).

Claim 14

Ratsaby anticipates threshold is applied to an output of the robust model

to classify a set of inputs that generated the output (**Ratsaby**, page 62, col 1,

lines 3 - 11).

Claim 15

Ratsaby anticipates the training error is defined as the sum of the squares

of the differences between output elements of the training data and outputs of the

modeling function associated with each of the input elements in the training data

(**Ratsaby**, page 57, col 2, lines 31 - 42).

Claim 16

Ratsaby anticipates the training error is defined as the sum of the

differences between output elements of the training data and outputs of the

modeling function associated with each of the input elements in the training data.

(**Ratsaby**, page 57, col 2, lines 31 - 42).

Claim 17

Ratsaby anticipates the training error is defined as the maximum

difference between output elements of the training data and outputs of the

modeling function associated with each of the input elements in the training data.

(**Ratsaby**, page 61, col 2, lines 25 - 29).

Claim 18

Ratsaby anticipates including normalizing the training data (**Ratsaby**,

page 64, col 1, lines 34 - 37).

Claim 19

Ratsaby anticipates including splitting a set of data into a training data set

and a cross validation training set (**Ratsaby**, page 60, col 1, lines 19 - 25).

Claim 20

Ratsaby anticipates recalculating the set of weights using both the training

data set and the cross validation data set (**Ratsaby**, page 60, col 1, lines 19 –

25).

Claim 21

Ratsaby anticipates the cross validation criteria is maximizing lift

(**Ratsaby**, page 60, col 1, lines 19 – 25; page 60, col 1, 40 – 41).

Claim 22

Ratsaby anticipates the cross validation criteria is minimizing a measure of

error between the model and the cross validation set (**Ratsaby**, page 60, col 1,

lines 19 – 25; page 60, col 1, 40 – 41).

Claim 23

Ratsaby anticipates selecting a modeling function having a set of weights

wherein the modeling function has a complexity that is determined by a

complexity parameter (**Ratsaby**, page 57, col 1, lines 14 – 27; page 59, col 1,

lines 54 – 56; page 59, col 2, lines 1 - 3); for a each of a plurality of values of the

complexity parameter, determining an associated set of weights of the modeling

function such that a training error is minimized for a training data set (**Ratsaby**,

page 59, col 1, lines 10 - 19; page 59, col 1, lines 54 – 56; page 59, col 2, lines 1

- 3);   determining a cross validation error for a cross validation data set for each

set of weights associated with one of the plurality of values of the complexity

parameter (**Ratsaby**, page 60, col 1, lines 19 - 25; page 59, col 1, lines 10 - 19;

page 59, col 1, lines 54 – 56; page 59, col 2, lines 1 - 3); determining an optimal

value of the complexity parameter that minimizes the cross validation error

(**Ratsaby**, page 60, col 1, lines 19 - 25; page 59, col 1, lines 10 - 19; page 59, col

1, lines 54 – 56; page 59, col 2, lines 1 - 3); and determining an output set of

weights of the modeling function using the determined optimal value of the

complexity parameter and an aggregate training data set that includes the

training data set and the cross validation data set such that an aggregate training

error is minimized for the aggregate training data set (**Ratsaby**, page 59, col 1,

lines 10 - 19; page 64, col 2, lines 14 – 19); and whereby the output set of

weights used with the modeling function provides the robust model (**Ratsaby**,

page 64, col 2, lines 14 – 19).

Claim 24

Ratsaby anticipates a memory configured to store a training data set and

a cross validation data set (**Ratsaby**, page 57, col 2, lines 24 – 42; page 60, col

1, lines 19 - 25); a processor configured to: select a modeling function having a

set of weights wherein the modeling function has a complexity that is determined

by a complexity parameter (**Ratsaby**, page 57, col 1, lines 14 – 27; page 59, col

1, lines 54 – 56; page 59, col 2, lines 1 - 3); for each of a plurality of values of the

complexity parameter, determine an associated set of weights of the modeling

function such that a training error is minimized for a training data set (**Ratsaby**,

page 59, col 1, lines 10 - 19; page 59, col 1, lines 54 – 56; page 59, col 2, lines 1

- 3); determine an error for a cross validation data set for each set of weights

associated with one of the plurality of values of the complexity parameter

(**Ratsaby**, page 60, col 1, lines 19 - 25; page 59, col 1, lines 10 - 19; page 59, col

1, lines 54 – 56; page 59, col 2, lines 1 - 3); and select the set of weights

associated with the value of the complexity parameter that best satisfies a cross

validation criteria (**Ratsaby**, page 60, col 1, lines 19 - 25; page 59, col 1, lines 10 - 19; page 59, col 1, lines 54 – 56; page 59, col 2, lines 1 - 3); and an output configured to output the set of weights associated with the value of the complexity parameter that best satisfies a cross validation criteria (**Ratsaby**, page 61, col 1, lines 1 - 11).

4   Claim 12 is rejected under 35 U.S.C. 102(b) as being anticipated by Bent (IEEE, 1045-9227/91/0500-0346, referred to as **Brent**).

Claim 12

Brent anticipates the plurality of values of the complexity parameter are selected to best satisfy the cross validation criteria using the Brent method (Brent, page 346, col 1, lines 22 – 24).

Conclusion

5.   The prior art of record and not relied upon is considered pertinent to applicant's disclosure.

> U.S. Patent Literature

> U. S. Patent 5,987,444; November 16, 1999

>> Anticipates in part Claims 1 – 24 (Abstract and Figs.1 – 19)

> Non-Patent Literature

> IEEE 0-7803-4859-1/98; January 1998

>> Anticipates in part Claims 1 – 24 (Abstract and Figs.1 – 2)

6.   Disclosure was anticipated by Ratsaby et al and Brent.

Correspondence Information

Any inquiry concerning this information or related to the subject disclosure

should be directed to the Examiner, Joseph P. Hirl, whose telephone number is

(703) 305-1668. The Examiner can be reached on Monday – Thursday from

6:00 a.m. to 4:30 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the

Examiner's supervisor, Thomas G. Black can be reached at (703) 305-9707.

Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

or faxed to:

(703) 746-7239 (for formal communications intended for entry);

or faxed to:

(703) 746-7240 (for informal or draft communications with notation of

"Proposed" or "Draft").

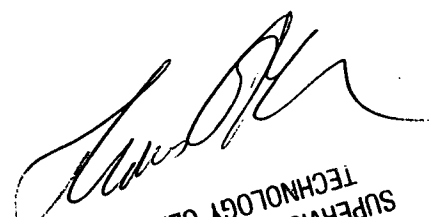Hand-delivered responses should be brought to:

Receptionist,

Crystal Park II,

2121 Crystal Drive,

Arlington, Virginia.

Joseph P. Hirl

Monday, January 14, 2002